

Interactive Computing

PRESS REVIEW

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Home Computer: Demand Lags

WHAT has happened to the home computer? What was once thought to be a billion-dollar, mass-market item that would revolutionize our lives seems suddenly to have lost its luster.

Even as such giant companies as Texas Instruments Inc. introduce new systems for the consumer, industry analysts, market researchers and even some executives in the field are taking a second look at the prospects for these, the smallest of computers.

The central question about the market for these systems seems to be whether the consumer really wants to pay \$500 to \$3,000 to balance the checkbook, educate the children and turn on the sprinklers. At this point the answer would seem to be no.

According to knowledgeable analysts, this is a market that never was. What today goes by the name of home computer, they say, is and always has been a hobby product for computer enthusiasts and not the average homeowner. And when the needs of these enthusiasts are satisfied, the analysts add, the market will have been saturated. Most manufacturers apparently realize this and are moving in other directions.

For example, when Lewis F. Kornfeld Jr., president of Radio Shack, the leading manufacturer in the field, recently introduced the company's latest line of small computers, the TRS 80 Model II, he stressed that it was not aimed at the consumer market but rather for the small-business man. "Don't call them home computers," he begged reporters at the news conference.

Then too, the market research company, Creative Strategies International, which has long been considered bullish on home computers, recently revised its market forecast downward for next year, from \$140 million to \$126 million.

With the exception of Texas Instruments, most of the major manufacturers in the business, like Apple Computer Inc. and Commodore International, are exhibiting their wares this week not at the Consumer Electronics Show in Chicago, but in New York at the professionally oriented National Computer Conference.

"The distinct trend in the personal computer industry today is that virtually all manufacturers are moving expeditiously toward serving the profession-

al, educational and very-small-business markets," said Benjamin M. Rosen, an electronics analyst with Morgan Stanley & Company.

At present, the industry, only about four years old, is operating in a three-tier market. At the low end, where most of the 50-odd companies in the business participate, machines cost about \$500, and, because of their limited hardware and software, are geared toward home education and entertainment — video games. These systems soon will face stiff competition from the makers of programmable calculators, which will be offering sophisticated calculators that will improve many of the functions.

In the middle tier are machines that sell for about \$1,000, such as Texas Instruments' 99/4 and the Apple II computer. These are designed to handle income taxes and other family finances as well as to operate appliances. The trouble here is that without the addition of \$1,000 worth of peripheral equipment, such as disk memory files, printers and maybe a telephone interface device, they offer little more in usable computing power than the low-end machines.

At the high end, there are machines aimed largely at the small-business man. These can cost as much as \$3,000, depending on what additional hardware and software is purchased, but function much as commercial minicomputers do, at less cost.

If in fact the home computer market never materializes, the need for the small-business machine is here today. The accountant, the two-person law firm, and the dry cleaner chain, for example, are all potential users of a machine like Radio Shack's TRS 80 Model II, which the company will be selling through its 7,000 retail stores.

The Radio Shack computer hardware includes an 80-character-per-line display, upper- and lower-case characters, and a memory system that can be expanded to two million characters.

But the secret to success in this market really involves software, which is easy to use. The small-business man, even more than the homeowner, does not want to become a professional programmer just to use the system. These machines can do the payroll and perform such additional office tasks as general ledger accounting and inventory and mailing list management.

Just as the maker of the low-end home computer is facing competition in the form of sophisticated calculators, manufacturers of such small-business systems are bumping up against — but are not yet in — territory controlled by the commercial minicomputer maker. It remains to be seen whether companies like Radio Shack can provide the kind of maintenance and software support that has been traditional in the commercial systems business.

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COMPUTERS

IBM shocks the plug-compatibles

If a new industry can spring up and in just five years place more than \$1 billion worth of products in the field, can it disappear just as fast? If it is in the computer business, and if the producers are competing head to head with giant International Business Machines Corp., the answer seems to be a qualified yes.

When IBM in January announced its incredibly powerful and inexpensive 4300 family—a new central-processor line to replace the aging low- and medium-range units of IBM's System 370 line—it delivered what some observers believed would be a mortal wound to the so-called plug-compatible manufacturers (PCMs). These companies make computers that operate on System 370 software and are sold to IBM customers at lower prices. If anything, the belief that the PCMs were badly hurt is growing even stronger now among analysts who follow the industry.

"The bloom is off the PCM rose forever," claims Frederic G. Withington, senior analyst at Arthur D. Little Inc. (ADL). Agrees Michael P. Burwen of Input, a Palo Alto (Calif.) market research firm: "The whole PCM concept is suspect now."

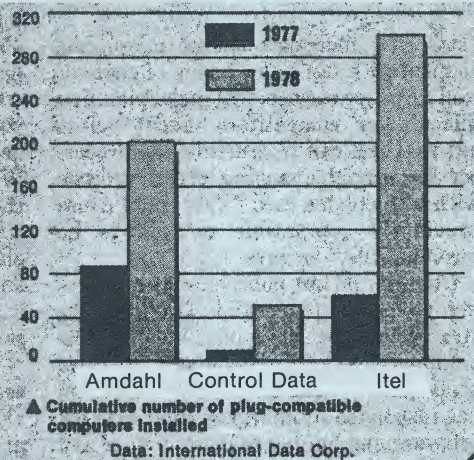
Losing money. Clearly, the 9 or 10 companies that make up this nascent industry already are hurting. Intel Corp., the leader in units installed, is losing money in computers now and has seen its stock tumble by more than 60% in the last nine months. Amdahl Corp., which pioneered the PCM concept and built a \$321 million business on it in five years, recorded its first quarter-to-quarter sales decline in two years for the first quarter of 1979. And that happened even though Amdahl's big machines do not compete directly with the smaller 4300.

At least one company that was planning a move into PCM computers has stopped the project. "We've given up," says Edward Farris, manager of the Computer Products Div. at Electronic Memories & Magnetics Corp. (EM&M). "We're convinced it's not a viable market over the long haul."

But like Mark Twain, most PCM executives are saying that reports of their death have been greatly exaggerated. "This is still a good business to be in,"

insists Stephen J. Ippolito, founder and president of IPL Systems Inc., which expects to ship in July its 100th IBM-compatible mainframe computer for marketing by Control Data Corp. Despite the 4300 announcements, Magnuson Systems Corp. has been able to win \$10 million in new financing from such sophisticated investors as Bessemer Securities Corp. and Hambrecht & Quist. And David N. Martin, manager of the Computer Systems Group at National Semiconductor Corp., claims that IBM's new aggressiveness "makes our strategy

The leading makers of plug-compatible computers



even more valid," although it has caused National to hold up production of its heavily promoted IBM-compatible model.

Surviving. What is obvious to everyone in the industry is that IBM has drastically changed the rules under which the plug-compatible market evolved. With increased use of advanced technology, with new pricing relationships among hardware, software, and maintenance, and with design concepts that may prove hard to emulate, IBM has swept aside previous assumptions about its vulnerability. "In the old days," admits Ippolito, "profit margins were ridiculously high. You could have low volume and sloppy management and still survive." Now, he figures, "only the strong competitors will survive."

In the short run, IBM itself may provide the makers of small plug-compatible computers with a golden marketing opportunity. After the 4300

was announced, IBM was deluged with so many orders that it had to extend its acceptance of "first-day" orders through Mar. 2. Estimates of the order volume run to 50,000 units and beyond. "Not everyone will take delivery," says Burwen of Input, "but even discounted by 60% it's a staggering number."

IBM still has not informed customers when they can expect delivery of the 4300, but the PCMs are hoping that if shipments are delayed by a year or more, they can help fill the availability gap. "I think IBM will be overwhelmed by the market they've created," says National's Martin. "If they could deliver off the shelf in 30 days, that would have a major impact on our viability. But if they show lead times of one, two, or three years, that's a major plus for us."

Little comfort. At best, however, shipping delays will provide the PCMs with only a temporary market niche. "There's a difference between a business and an opportunity," says Farris in explaining why EM&M finds little comfort in IBM's possible delivery problems. Most of the PCMs will try to use that breathing space to develop strategies that will give them an edge before an almost-inevitable shake-out thins their ranks. Withington of ADL predicts that the PCMs will have to change their very nature to survive. "They'll have to play the game on the service and software side," he says.

Playing catch-up will be a novelty for the PCMs. Taking their cue from Amdahl, which used advanced semiconductor technology to outperform IBM's biggest computers, other companies have been able to exploit chinks in IBM's technological armor up and down the aging System 370 line. By last year, according to estimates by International Data Corp., the PCM installed base had reached 434 machines worth \$818 million in the U. S. And that base will more than double this year, the market research firm predicts. But with the 4300, IBM has recaptured technological leadership, in the view of many analysts. "The PCMs can only react to Armonk [IBM headquarters]," says C. Oakley Mertz, research vice-president at International Data. "There's no way they can anticipate now."

Crucial question. The first problem is to figure out exactly what matching the 4300 in performance involves. "At this point," notes one competitor, "we don't even know how much of the performance load is carried by the hardware and how much by the software."

This is a crucial question for National

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Semiconductor, which must decide how to proceed with its aborted System 400. Martin believes that the 4300 will create a huge market for computers that are "program-compatible" with IBM, but to take advantage of it, he must first make sure the 400 is fully compatible with the IBM machine. "We have to either cut the price to get it down to the 4331 [the smallest announced member of the 4300 family] or enhance the performance to get it up to the 4341 [the top of the line]," Martin says. The effort to catch IBM has helped to delay the 400 by six months, he acknowledges.

The full impact of IBM's leap in hardware technology may not be clear until the first 4300 is delivered and the PCMs have a chance to take it apart. But it already is clear that IBM has gained some important advantages in processing speeds and manufacturing costs with its concept of packaging high-density logic chips in a new multilayer ceramic module. John C. Lewis, president of Amdahl, points out that the logic chips themselves use a slower-speed process than the devices employed by Amdahl. But Jared A. Anderson, president of Two Pi Corp., which makes IBM-compatible minicomputers with roughly the performance of the smallest 4300 model, calls IBM's packaging approach "spectacular." So far, he notes, the merchant semiconductor industry has been unable to equal IBM's technique.

The independents will also have a problem trying to match IBM's memory pricing, which is based on extensive use of memory chips that can each store 65,536 bits (64K) of computer data. Martin of National, which is primarily a semiconductor producer, derides the IBM 64K chip as "big, slow, and a power hog," and insists that the semiconductor industry will be "very competitive" with IBM in memory. But the industry has its hands full trying to meet demand for the smaller 16K memory devices, and volume production of the 64K is not expected until 1980.

Matching the changes. Another concern of the PCMs is IBM's increased use of secret, microcoded instructions that are stored on a disk memory and used to enhance performance and even to change the operating characteristics of the 4300. Just how significant this step will be is a matter of dispute. "What they did was relatively mild," says Ippolito. "They could have put more in microcode."

But Charles P. Lecht, president of Advanced Computer Techniques, sug-



National Semiconductor's Martin: After IBM's 4300 debut, rethinking strategies.

gests that increased use of microcode, coupled with IBM's new policy of centralized software service, will make planning difficult for competitors. Lecht points out that IBM can restructure the processor by simply changing the microcode with a telephone call. "This could cause previously compatible devices to be incompatible," he says.

Changes in IBM policies are also forcing the PCMs to rethink their service strategies. For example, IBM is now handling most of its customers' software problems over the telephone. Magnuson has responded by charging a flat rate for software and hardware maintenance and counting on the modular design of its computers to allow software-trained service representatives to handle both tasks. But Lecht of Advanced Computer Techniques believes that "it will be hard for a PCM to establish the same kind of support network and provide the same kind of service as IBM."

Another big jump. Not every PCM is directly affected by the new IBM family. In fact, Amdahl's Lewis points out that a proliferation of small mainframes could actually increase demand for large computers required to control distributed-processing networks. "That's our niche," he says. "We just build the biggest, fastest machine we know how to build." So far, Amdahl has managed to stay ahead of IBM in price/performance. "The question is," notes Peter Labé, first vice-president of Smith Barney, Harris Upham & Co., who follows Amdahl closely, "Can they compete with the next generation?" Labé looks for another big jump in price/performance when IBM

announces its widely discussed "H series" of large computers later this year or early in 1980. But he expects Amdahl to match it. "I think those guys are real," he says. "They're here to stay."

Opportunities. One niche left to the PCMs is supplying raw hardware to original-equipment manufacturers (OEMs), rather than bumping heads with IBM in the end-user market. Jean-Michel Gabet, computer industry analyst for Gnostic Concepts Inc. points out that so far IBM has not pursued the OEM business at all, and he expects Two Pi and others aiming mainly at OEM customers to survive. Two Pi's deal to supply hardware to National CSS Inc., a time-sharing company that is entering the systems business, is still intact, although National CSS has had to reduce prices.

Software companies, in fact, may find a host of new opportunities in the post-4300 world. "IBM has been shifting the price burden on its systems from hardware to software for at least two years," points out Mertz of IDC, "and the 4300 is an incremental step in that trend." While IBM still furnishes free of charge the basic operating systems required to run its computers, it has started offering enhancements that can cost hundreds of dollars per month. "This could create a market for compatible programs at cheaper prices," says one analyst.

On the 4300, IBM's software pricing seems almost as aggressive as its hardware pricing. Lawrence N. Salveson, president of Software Pursuits Inc., which markets a replacement for IBM operating systems, calls the price of 4300 software "ridiculously low," although he concedes that sales in the thousands might well justify it. But Salveson insists that the market for independent products is still wide open. "We can certainly match IBM's performance and we can compete on features," he says.

As IBM shifts more of the price burden from hardware to software, the PCMs will clearly have to follow. "If the small PCM wants to survive," says Withington of ADL, "it has to get into software." But even for the biggest PCMs, this will prove no easy task. Smaller PCMs, strapped for resources to keep up just in hardware technology, may have to join forces with a software specialist. Sums up William R. Becklean, an analyst for Bache Halsey Stuart Shields Inc.: "It will never become impossible to build plug-compatible products, but it will become increasingly difficult. This business isn't going to be fun any more."

A Look At IBM'S DDP Products

Distributed processing has been steadily gaining momentum over the last few years. In 1975, there was only an estimated \$50 million worth of processing equipment being employed in a distributed processing environment. By yearend 1978, the total had risen to *over \$1.1 billion* — representing a 180% per annum growth. This early success has been due mainly to the efforts of the minicomputer vendors. Their approach has been selling "tools" to solve problems: thus, when many users began to feel the need to off-load some of their work to smaller processors, the minicomputer suppliers were waiting.

IBM, meanwhile, was notably absent from this arena. It was not until October of 1978 — years after other suppliers had been successfully implementing DDP networks, that IBM announced its entry into the market with the 8100 Information System. By this time DDP had already become established; having gained wide acceptance in the user community. In fact, the words "distributed processing" had not been used by IBM in *any public context* prior to the 8100 announcement. The White Plains Computer Manufacturer is undoubtedly planning to make up for lost time. IBM has made it quite clear that it intends to become a major force in distributed processing — or to use their nomenclature — "Cooperative Network Processing".

With the announcement of the 8100, IBM plunged head first into the distributed processing market. If the apparent level of orders is any indication, then the 8100 will have tremendous success. It is rumored that between 25,000 and 44,000, 8100s are on order worldwide. IBM is offering two models: the 8130 and the 8140. Both machines can operate in a standalone environment to serve single departments/locations, or can connect to a System/370 host.

One of the interesting developments has been the degree of overlap in the DDP offerings between IBM's Data Processing Division and its General Systems Division. Originally, DPD marketed products to the larger user, while GSD concentrated on the smaller user. As time has gone by, the potential customer bases for each division have begun to overlap more-and-more. The Data Processing Division introduced the 8100 Information System and the 4300 family of processors. In the meantime, the General Systems Division, announced the System/38, plus the availability of quantity discounts on the Series/1. With the various products which it now calls

distributed processing equipment, IBM can offer a comprehensive set of alternatives for the user community.

Each of the above products may be used in a distributed processing environment, yet each will *retain its own specific identity*. IBM, of course, intends for the 8100 to become the industry standard distributed processing pro-

duct. The other products, however, have primary missions other than distributed processing. The 4300 series, for instance, is geared toward the replacement of lower end System 370 installations.

IBM DDP Products Characteristics

	8100 SYSTEM		System/38	Series/1	4300 SYSTEM	
	8130	8140			4331	4341
Model	A23	A53	3	5	I1	K1
Price	\$292,940	\$46,980	\$70,210	\$34,920	\$68,760	\$248,760
Main Memory	512 KB	512 KB	512 KB	128 KB	512 MB	2 MB
Disk	64 MB	64 MB	64 MB	28 MB	64 MB	37 MB
Diskette	Yes	Yes	Yes	Yes	Yes	Yes
Maximum Memory	512 KB	512 KB	1 MB	256 MB	1 MB	4 MB
Maximum Disk	192 MB	320 MB	387 MB	258 MB	1032 MB ¹	18,272 MB ²
3270 Use	Yes	Yes	Yes	No	Yes	Yes
Other CRT	2550/3440 Char.	2550/3440 Char.	1920	1920	1920	1920
Programming	Assembler FORTRAN COBOL	Assembler FORTRAN COBOL	RPG III	Assembler FORTRAN COBOL	BASIC COBOL	BASIC COBOL

1. 16 Spindles 2. 32 Spindles

IDC sees the 4300 being used at regional/divisional branches or operational levels of large corporations, providing "host-type" performance and power, as well as DDP network capabilities. Interestingly, IDC recently learned that the DDP label was attached to the 4300 only a *few months* before the product was announced. Also of interest, is the fact that many orders for the 8100 have actually been canceled as a result of the 4300 announcement. In certain situations, where users would require maximum capacity from an 8100, they are now opting for the higher performance capabilities and latitude for growth which the 4300 offers. In addition, delivery dates for the 4300 are promised to be much earlier than for the 8100.

In similar fashion, the System/38 announced last October, is aimed primarily at System/3 users and System/34 users who are looking to upgrade. Still, this product may also be considered by IBM users as a potential DDP tool. Although the System/38 cannot communicate with other System/38s, and can communicate only with specific IBM hosts, it does have certain traits which make it suitable for various forms of distributed processing.

The Series/1, announced in November of 1976, was IBM's first minicomputer. Although targeted at the traditional mini market, the Series/1 has had minimal impact — due in part to early user disappointments. The Series/1 soon began to find its way into DDP environments, where users felt that distributed processing required a sophisticated minicomputer, and where they also wanted to stick with IBM as a supplier. The fact remains, however, that IBM still sees the Series/1 as a competitor in the traditional minicomputer market, even though it is not adverse to users who wish to implement it in an alternative form of DDP.

The preceding research on IBM's DDP Products was recently published in a memorandum by IDC's *Information Systems Planning Service*.